

WHAT IS CLAIMED IS:

1. A process for preparing a high impact polystyrene comprising admixing a rubber and styrene monomer in the presence of at least two polymerization
5 initiators and polymerizing the styrene wherein at least one of the at least two polymerization initiators is a grafting initiator and at least one of the at least two polymerization initiators is a non-grafting initiator.
2. The process of Claim 1 additionally comprising polymerizing the styrene
10 monomer in the presence of a chain transfer agent.
3. The process of Claim 1 wherein rubber is selected from the group
consisting of polybutadiene, styrene-butadiene rubber, styrene-butadiene-
styrene rubber, natural rubber, and mixtures thereof.
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4. The process of Claim 3 wherein the rubber is polybutadiene.
5. The process of Claim 1 additionally comprising including a solvent in the
admixture.
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6. The process of Claim 5 wherein the solvent is selected from the group
consisting of ethylbenzene, toluene, xylenes, cyclohexane, and mixtures thereof.
7. The process of Claim 5 wherein the solvent is an aliphatic hydrocarbon
25 solvent.

8. The process of Claim 1 wherein the grafting initiator is selected from the group consisting of 1,1-di-(t-butylperoxy)cyclohexane; 1,1-di-(t-amylperoxy)cyclohexane; 1,1-di-(t-butylperoxy)-3,3,5-trimethyl-cyclohexane; OO-t-amyl-O-(2-ethylhexyl monoperoxy-carbonate); OO-t-butyl O-isopropyl
5 monoperoxy-carbonate; OO-t-butyl-O-(2-ethylhexyl)monoperoxy-carbonate; butyl-4,4-di(t-butylperoxy)valerate; Ethyl 3,3-Di-(t-butylperoxy)butyrate; and mixtures thereof.
9. The process of Claim 8 wherein the grafting initiator is 1,1-di-(t-butylperoxy)cyclohexane.
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10. The process of Claim 1 wherein the non-grafting initiator is selected from the group consisting of 2,2'-azobis(isobutyronitrile), 2,2'-azobis(2-methylbutyronitrile), lauroyl peroxide, decanoyl peroxide, and mixtures thereof.
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11. The process of Claim 10 wherein the non-grafting initiator is 2,2'-azobis(isobutyronitrile).
12. The process of Claim 1 wherein the high impact polystyrene is prepared
20 using an upflow reactor.
13. The process of Claim 12 wherein the process is a continuous process.
14. The process of Claim 1 wherein the temperatures range for the
25 polymerization is from about 100°C to about 230°C.

15. The process of Claim 14 wherein the temperatures range for the polymerization is from about 110°C to about 180°C.
16. The process of Claim 1 wherein the grafting initiator is present in an amount of from about 50 to about 1000 parts per million and the non-grafting initiator is present in an amount of from about 100 to about 600 parts per million.
17. The process of Claim 16 wherein the grafting initiator is present in an amount of from about 100 to about 600 parts per million and the non-grafting initiator is present in an amount of from about 100 to about 500 parts per million.
18. The process of Claim 1 wherein the grafting and non-grafting initiators are present in a ratio of grafting to non-grafting initiator of from about 1:10 to about 10:1.
19. The process of Claim 18 wherein the ratio of grafting to non-grafting initiator is from about 1:3 to about 3:1.
20. The process of Claim 19 wherein the weight ratio of styrene to rubber is from about 99:1 to about 7:1.
21. The process of Claim 1 wherein the admixture includes an additive.
22. The process of Claim 21 wherein the additive is selected from the group consisting of chain transfer agents, talc, anti-oxidants, UV stabilizers, lubricants, mineral oil, plasticizers

23. The process of Claim 1 additionally comprising removing residual monomer or solvent from the product high impact polystyrene.

24. A high impact polystyrene prepared by the process of Claim 1.

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